tion in geographical position, that we are to find an explanation of the modified effects of temperature.

The results of recent investigations on this theory seem to warrant the recognition of a principle of modified thermal influence which is intimately related to the principles on which the bioclimatic law is founded.

In an effort to determine a gradient or unit constant by means of which the intensity of this modifying influence, *from whatever cause*, could be measured and computed, it was found that a general average rate of 0.25° F., or its equivalent of one day in time, for each 1° isophane and 400 feet of altitude could be utilized for correcting the recorded thermal means or the computed date constants for any given geographical position so that there would be a reasonably close agreement between the cause as represented by the modified temperature and the effect as represented by the recorded date of an event.

In comparing the departures of the recorded from the computed dates of events in the different regions by the modifying method it was found that, in general, the regional departures, as determined by the usual method, were accounted for. It must not be expected, however, that anything but the general regional influences can be interpreted by this method because it can not provide for the topographic and other influences which are reflected in the local departures.

There is need of further investigations of the problems relating to this proposed principle and it is hoped that they will receive due consideration by meteorologists as related to the laws and principles of temperature, light, etc., and by biologists and physicists as related to the practical application of the principle in their investigations of the responses of organisms to the influences represented by temperature and other elements and that there will be cooperation in the investigations of the relations of causes and effects.

It appears, however, that the present state of information on the coordinate relation of thermal unit constants to the other unit constants of the law will justify a revision of the first table of coordinates[2] as related to (*a*) latitude, longitude, and altitude, and (*b*) the isophanes and altitude, as follows:

Tables of geographic coordinates and unit constants of the bioclimatic law.

(*a*) FOR LATITUDE, LONGITUDE, AND ALTITUDE.

Coordinates.	Unit constants.				
				Modifying.	
Geographic.	(*a*) Geographic.	(*b*) Time.	(*c*) Thermal mean.	(*d*) Thermal.	(*e*) Time.
			°F.	°F.	
1. Latitude	1°	4 days	1	0.25	1 day.
2. Longitude	5°	do	1	.25	Do.
3. Altitude	400 feet	do	1	.25	Do.

(*b*) FOR ISOPHANES AND ALTITUDE.

Coordinates.	Unit constants.				
				Modifying.	
Geographic.	(*a*) Geographic.	(*b*) Time.	(*c*) Thermal mean.	(*d*) Thermal.	(*e*) Time.
			°F.	°F.	
1+2. Isophane	1°	4 days	1	0.25	1 day.
3. Altitude	400 feet	do	1	.25	Do.

[2] Journal of the Washington Academy of Sciences, Jan. 19, 1920, p. 38.

CLIMATIC CONDITIONS IN A GREENHOUSE AS MEASURED BY PLANT GROWTH.[1]

Climatic conditions are usually stated in terms of temperature, rainfall, percentage of sunshine, relative humidity, etc. A few attempts have been made to measure such conditions in terms of plant growth. In one of these experiments the climatic conditions of a greenhouse were expressed as rates of certain definite plant processes. The experiment was carried out (1916–1917) in one of the greenhouses of the Laboratory of Plant Physiology of the Johns Hopkins University at Baltimore, Md. Buckwheat seedlings of approximately the same size and from the same stock of seed were grown for a series of 4-week exposure periods over a total time period of 13 months. Such culture plants were considered the instruments for measuring the climatic conditions as these affected the plant processes. Values representing the process of dry-weight production, leaf-area increase and transpirational water loss increased during the spring and decreased during the autumn with maxima in summer and minima in winter. The rates of stem elongation, however, showed remarkably low values for a period about the summer solstice. Approximate indices of efficiency of these climatic conditions in this particular greenhouse to favor these plant processes may be briefly stated in relative numbers for each calendar month as follows:

Month.	Stem height.	Dry weight.	Leaf area.	Transpiration.
January	0.64	0.13	0.20	0.11
February	.70	.27	.35	.24
March	1.03	.61	.63	.63
April	1.30	.90	.84	.87
May	1.34	1.00	.95	.96
June	1.00	1.00	1.00	1.00
July	1.30	.94	.91	1.00
August	1.46	.81	.79	.95
September	1.40	.61	.63	.69
October	1.14	.39	.49	.40
November	.92	.22	.37	.24
December	.76	.15	.27	.15

The approximate annual ranges (ratio of maximum to minimum) were: Stem height, 2; dry weight, 8; leaf area, 5; transpiration, 9.—*Earl S. Johnston, Laboratory of Plant Physiology, Maryland Agricultural Experiment Station.*

THE DISTRIBUTION OF MAXIMUM FLOODS—DISCUSSION.

We have received a letter from Mr. H. R. Leach, of Saginaw, Mich., commenting on the paper by Prof. A. J. Henry upon "The Distribution of Maximum Floods," which appeared in the December, 1919, REVIEW and calling attention to the following points: (1) That true comparison of the magnitude of floods occurring in different years can be made only by comparison of the volume of flow, and (2) that at some of the Weather Bureau gages known to him the zero of the gages are not referred to a fixed plane of reference, and he gives two examples which will be referred to later.

The first point made by Mr. Leach is well taken, but since discharge measurements are not available, recourse was necessarily had to gage heights.

With reference to the second point: In establishing new gaging stations, the uniform practice of the Weather Bureau during the last 8 or 10 years has been to set the zero of the gages to correspond with the bottom of

[1] Author's abstract of paper presented before American Meteorological Society, Washington, D. C., Apr. 22, 1920.